Regarding the Use and Limitations of Model Projections in Evaluating and Comparing Remedial Alternatives in the IR FS
March 21, 2019 (Final)

The Lower Passaic River Study Area (LPRSA) Hydrodynamic/Sediment Transport (HST) and Contaminant Fate and Transport (CFT) numerical model results will be among the various metrics used to evaluate the feasibility study (FS) alternatives for the potential interim remedy (IR) for the upper 9 miles of the LPRSA. Although the current models are considered calibrated and sufficient for the purposes of preparing the IR FS, significant framework and parameter uncertainties associated with components of the complex LPRSA system limit the accuracy of the models' predictions, especially related to delineating areas subject to erosion and deposition, and to surface sediment recovery trends. The USEPA, NJDEP, and the CPG (the FS Team) have identified and acknowledged that a high degree of caution should be applied when using those predictions to evaluate remedial alternatives.

Given the current uncertainty of the predictions, the evaluation and use the of model projections in the IR FS (and the Proposed Plan and Record of Decision for the IR, if an IR is selected) should be limited and strictly adhere to these guiding principles:

- Numerical modeling is only one of several FS metrics that will be used to evaluate the IR alternatives.
- Absolute differences in model-projected post-IR concentrations and rates of recovery among alternatives will not be considered; this is consistent with USEPA's OLEM's January 2017 Recommendation 7 (last paragraph).
- Model-projected post-IR concentrations will not be compared to any concentration thresholds or to consider the duration of time to reach any concentration thresholds.
- Model-projected post-IR concentrations and rates of recovery will be expressed as ranges. The ranges will be established by the differences among the multiple projections conducted to assess uncertainty[1].
- The multiple projections will be conducted for the 75 ppt post-IR target SWAC alternative and used to define relative uncertainty, which will be applied to the other alternatives.
- Model-projected post-IR concentrations and rates of recovery will be used to compare the active IR alternatives to each other and to the MNR alternative.
- When comparing alternatives, any overlap in the ranges of post-IR concentrations and rates of recovery will be assessed to better understand the magnitude of model uncertainty relative to the modeled differences in alternatives. Overlap will not in itself be presumed to render alternatives indistinguishable. Whether differences in model-projected post-IR

[1] By using different conditional simulation maps and different assumptions regarding remediation (i.e., assumptions for partial model grid cells), a range of predicted recovery rates and post-IR concentrations will be developed.

concentrations and rates of recovery are meaningful or not will be assessed once the model projections are complete and the results are reviewed by the FS Team.

- Projections will not be used in the IR FS for decision-making in an absolute sense, including to judge the underlying setup of the modeling projections, to conclude the underlying appropriateness of the IR alternatives evaluated, or to extend the projections to future risk-based remediation decisions.

Specific modeling metrics for the evaluation of IR FS alternatives are outlined below including modeling results, the associated comparative metrics and methods of comparison.

Model Result	Metric to Compare Alternatives	Method of Comparing Ranges of Results Among Alternatives	Cross Reference to FS Metrics Table
Average Surface Sediment COPC Concentration (SWAC) for RM 0-RM 8.3 and for RM 8.3-RM 15	Rates of change to the end of the projection period	Rates of change compared among active IR alternatives and MNR, and relative changes in rates for active IR alternatives compared to rate for MNR	1
	End of year averages to the end of the projection period	End of year averages compared among active IR alternatives and MNR, and relative changes in end of year averages for active IR alternatives compared to MNR	2
Average Water Column COPC Concentration for RM 8.3-RM 15	Rates of change to the end of the projection period	Rates of decline compared among active IR alternatives and MNR, and relative changes in rates for active IR alternatives compared to rate for MNR	3
	Averages during the IR implementation period	Averages compared among active IR alternatives and MNR, and relative changes in averages for active IR alternatives compared to MNR	4
	End of year averages to the end of the projection period	End of year averages compared among active IR alternatives and MNR, and relative changes in end of year averages for active IR alternatives compared to MNR	5
COPC Flux at RM 0, RM 8.3, and RM 15	Annual averages to the end of the projection period	Averages compared among active IR alternatives and MNR, and relative changes in averages for active IR alternatives compared to MNR	6
	Cumulative fluxes to the end of the projection period	Cumulative fluxes compared among active IR alternatives and MNR, and relative changes in cumulative fluxes for active IR alternatives compared to MNR	7
	Averages during IR implementation period	Averages compared among active IR alternatives and MNR, and relative changes in averages for active IR alternatives compared to MNR	8
	Cumulative fluxes during IR implementation period	Cumulative fluxes compared among active IR alternatives and MNR, and relative changes in cumulative fluxes for active IR alternatives compared to MNR	9